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ABSTRACT

There has been a growing relationship between the profession of counseling and computers over the last four decades. The focus in the 1950s and 1960s was on producing programs that could emulate a human therapist and computer-aided instruction. In the 1970s and 1980s computing technology was utilized primarily for counseling intervention and service management as well as counselor education and supervision. However, not until the 1990s has the number of counselors and counselor educators involved with using computers grown to represent the actual adoption of the technology by the profession. In looking to the future, computers will, in all likelihood, continue to have an impact not only on the counseling profession but also in a wider sense on our culture and human identity itself. Counselors are socially sanctioned healers and as such they may have a role that goes beyond simple use of a technology; they may have a role in understanding the impact of that technology on society. Because humans like to apply anthropomorphism to machines, counselors must be careful in the future not to do the reverse and apply mechanomorphism to their clients and students. Perhaps the greatest challenge to the counseling profession will be not only to exploit the benefits of the computer/counseling relationship, but also to advocate for the use of computer technology by the society as a whole in ways that protect rather than diminish human freedom and dignity. (Contains 38 references.) (MKA)

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Historical Context: The Relationship of Computer Technologies and Counseling

PAUL F. GRANELLO

Computers are not new. They have been around for over half a century. ENIAC, a huge machine that used vacuum tubes, was invented in 1946 (Fargis & Bykofsky, 1989). The relationship between computers and counseling is not new, either, and has existed for decades. However, the impact and focus of computer technology on counseling, and in wider sense psychotherapy, has changed over time. As we look forward as a profession to the future of the computer-counseling relationship, it may serve us to first briefly look back. This reminiscence will help us orient ourselves before looking into a future with its many possibilities. It will also help us to remember that as counselors we have a unique role in society: to advocate for technology that enhances rather than degrades the human condition (Fromm, 1968). It is within this context that this chapter reviews the evolution of the relationship between computers and counseling—both the delivery of counseling treatments and the education and training of future counselors.

THE 1950s AND 1960s: MAINFRAMES, MINIS, AND COMPUTER AS THERAPIST

Mainframe computers were around during the 1950s but were very expensive and only available to the government and to large universities. Computational time was a scarce resource, and emphasis was placed on efficient use of computer time. Computer programming languages were designed for efficient use by the ma-

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chine rather than the convenience of the human user. These limitations restricted the development of computer applications for counseling. However, during the 1950s theorists like B.F. Skinner and Norman Crowder developed ideas about programmed instruction that are the historical antecedents for the modern computer-aided instruction and web-based distance education that are currently in vogue (Niemiec & Walberg, 1989).

In the early 1960s minicomputers came to replace mainframes. In 1962 Digital Equipment Corporation produced the first minicomputer. Minicomputers utilized the integrated circuit that had been invented in 1959 at Texas Instruments. They were smaller than mainframes, more powerful, and more affordable (Fargis & Bykofsky, 1989). Access to computers became a more plentiful resource, and more user-friendly programming languages were developed, including BASIC, PASCAL, and specialized programs for computer-aided instruction called PLATO and ILLIAC. Thus it is really in the 1960s that the relationship between computers and counseling and psychotherapy began in earnest.

Counseling Therapy

Early efforts at integrating computers with psychotherapy aimed at producing computer programs that could emulate a human therapist. One example is ELIZA, a famous early program developed by Joseph Wizenbaum in 1966 that allowed people to talk to it as they could with a real counselor in therapy (O'Dell & Dickson, 1984). The program was based on the reflective qualities of Person Centered Therapy promoted by Carl Rogers, and it is still available today on the World Wide Web (www-ai.ijs.si/eliza-cgi-bin/eliza_script). Another example, developed by Colby, Watt, and Gilbert (1966), intended to conduct a therapeutic dialogue with the user. The theory embodied in the program was that of psychoanalytic free association. Both program examples had several flaws. One of the most important of these was the computer's inability to process "natural language." Computers have a hard time understanding what people mean when they use colloquialisms such as "The audience gave the musician a hand." In this case, the computer has to know that in the context of a musical performance *giving a hand* does not literally mean a human appendage but rather applause (Sharf, 1985)!

After these initial attempts at developing computer therapists, researchers concluded that the computer had serious limitations and, as a tool for providing therapy, could probably not replace counselors in the near future.

Computer-Aided Instruction (CAI)

In addition to the interest in using computers for counseling interventions, there was a developing interest in using computers to deliver education and training programs. International Business Machines Corporation (IBM) was influential in the early development of CAI and by 1959 had developed the first program for teaching mathematics. In 1963, in cooperation with Stanford University, IBM released COURSEWRITER, the first programming language for CAI, complete with an entire elementary curriculum (Niemiec & Walberg, 1989). Another leader in the development of CAI was the Computer Education Research Laboratory (CERL), which worked closely with Control Data Corporation to develop PLATO (Programmed Logic for Automatic Teaching Operations). PLATO became the most widely used instructional program in both the United States and Europe and was primarily directed at college-level instruction (Niemiec & Walberg, 1989). PLATO was significant to the computer-counseling relationship because it represented the development of a programming language for nonprogrammers by allowing experts from diverse disciplines to put their course content onto computers without needing to be programming experts.

In the counseling and psychotherapy world, the end of the 1960s led to a call for more accountability from the profession for demonstrating the efficacy of the many theories that had been proposed during the decade. The mantra became, What works for whom and under what conditions? This movement in the profession created an interesting spin-off dynamic within the counseling-computer relationship. Because the logical and intuitive methods by which human counselors worked in counseling were poorly understood, representing them as a computer process was not possible. It was hypothesized that efforts to articulate clearly the counseling treatment process so that it could be programmed for the computer might lead to improved understanding of the process itself, and

thus to advances in technique and theory (Wagman & Kerber, 1984). Just as in many other areas of society during the 1960s, the computer-counseling relationship was one of experimentation, which led to an understanding that the computer could not readily replace therapists.

THE 1970s AND 1980s: MICROCOMPUTERS FOR EVERYONE (WHAT CAN I DO WITH IT?)

Computer technology took giant strides forward in the 1970s and 1980s with the advent of the microcomputer. Although predictions of paperless offices have never come to pass, the microcomputer has changed society, moving us from the industrial age to the information age. Computing power has increased steadily from the first microcomputer in 1973 thoughout the 1980s and 1990s with concurrent reductions in cost. During the 1970s and 1980s computer access became a relatively plentiful resource in the United States, with many schools and public libraries equipped with computers. Although counselors were first predicted to be resistant to using microcomputers, this has proven not to be the case. Computer use by counselors and psychotherapists grew considerably during the 1980s (Cairo & Kanner, 1984), and with increased counselor access to computers, the questions became, How can they be used? and What are the ethical issues that arise from those uses? (Engels, Caulum, & Sampson, 1984).

Counseling Intervention and Service Management

During the 1970s and 1980s, as the number of practitioners grew, numerous applications for the computer were developed for a variety of counseling activities including counseling interventions, personality testing, career guidance, and client data management for program evaluation (Alpert, Pulvino, & Lee, 1984). Counselors and psychotherapists realized that the computer could not handle therapeutic work like a human therapist but could perhaps play an adjunctive role to therapy. Therapists began to use the computer to work with a client's specific treatment problem when a corresponding well-defined treatment strategy could be employed (Wagman & Kerber, 1984). Two examples were notable. The first, the PlatoDCS system (Wagman & Kerber, 1978), used the PLATO language for a

dilemma counseling system that could be used with clients who felt "caught" when making a decision between two adverse consequences. This program provided the client with a structured model for solving dilemmas (Wagman & Kerber, 1984). The second example, MORTON (Selmi, Klein, Greist, Jonhson, & Harris, 1982), was designed to use a cognitive therapy approach to work with clients with mild to moderate depression. The program was highly educational in nature and focused on teaching clients to identify underlying cognition, which may lead to depression. Both programs demonstrated the efficacy of using computers as adjuncts to counselors when the computer task was well defined in areas such as cognitive psychotherapy, therapeutic games, biofeedback, and behavior therapy (Lawrence, 1986; Matthews, DeSanti, Callahan, Koblenz-Sulcov, & Werden, 1987). Programs such as these, however, are still not commonly used by clinicians in the field.

During the 1980s, the use of the computer as an adjunct to therapy significantly affected the counselor activities of client assessment and career counseling. Today, virtually all major assessment instruments for vocational guidance and personality testing are available in computer-administered or scored formats (Ben-Porath & Butcher, 1986; Jackson, 1985). Testing represents a structured event that computers handle well, freeing up clinician time and facilitating scoring of instruments. The educational components of vocational guidance are also delivered well by a computer because they are primarily informational. Several major systems have evolved, including CIS, SIGI Plus, and Discover (Kapes, Moran-Mastie, & Whitfield, 1994). Sampson et al. (1994) have provided a useful comparison of 15 computer-assisted guidance systems.

The later part of the 1980s saw the development of managed behavioral health care and the use of proprietary computer databases to track service delivery to clients by third-party funding sources. Many counselors saw this information collection as burdensome and threatening, possibly due to the one-way nature of the process, perceptions concerning violations of the traditional client counselor confidentiality ethics, and the feeling that the information was often used to deny treatment to the client more for the purposes of cost containment than client care. Suddenly, computers were being used to assist outsiders to regulate our profession. Many counselors

reacted against technology, feeling that they should not have to justify themselves or demonstrate their effectiveness, that what they did was not quantifiable or programmable. The ascendancy of cognitive therapy that occurred during the 1980s was promoted by the computer-counseling relationship, and by the third-party managed-care funders looking for "critical pathways" of care that could make counseling a predictable and therefore "capitated" process. Therapy decisions needed to be as clear cut as the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1980, 1994) decision trees (which resemble computer algorithms) made them appear. The accountability press of the 1980s wanted mental health treatments to have predictable outcomes, to serve as data in a computer program.

Counselor Education and Supervision Applications

Using the computer for counselor training was explored during the 1980s, both in terms of the development of new software programs and investigations into the pedagogy of teaching with computers (Hosie & Smith, 1984; Phillips, 1983). By 1984 *Counselor Education and Supervision* devoted a special issue to computers and counselor education. Explorations into developing computer applications for counselor training included those for acquisition of facts, development of skills, personal and professional development, exam administration, statistical analysis for research, and supervision (Froehle, 1984; Lee & Pulvino, 1988; Phillips, 1984a, 1984b; White, 1988).

Let us examine one of these areas—the development of student skills—in which applications were explored. One of the tasks confronting a counselor trainee is to learn to distinguish among the array of presenting behaviors of clients and to select an appropriate response given any one particular constellation of behaviors. Simulation has long been employed in counselor training efforts through role-play and modeling. The idea of having a computer that could simulate a client for student practice before working with a real client seemed appealing. The computer could allow the instructor to control the information that the student was given, including a specific diagnosis, or set of demographic features. Client 1 was an example of a simulation program in which several emotional and

demographic factors could be manipulated for the student to get a variety of practice in diagnosis (Hedlund, Vieweg, & Cho, 1987). This simulation training had the advantage of allowing several student counselors to work with the same computer client and then discuss with each other their approaches. In addition, the same student could work with the same computer client in a trial-and-error fashion without the relationship variables changing. Some of the drawbacks of working on simulations are, of course, the lack of nonverbals (although this can be overcome with today's technology) and a lack of random or intuitive behavior on the part of the client.

The Great Therapists Program (Halpain, Dixon, & Glover, 1987) was an example of a program related to the process of modeling responses for students. It provided the student with a client statement, allowed the student to type in his or her response, and then displayed a response from a master therapist from three different counseling orientations for the student to compare to his or her own response. The program was promoted as a method for students to learn how to apply a theory to client statements. Another example was the SuperShrink program (Lowman & Norkus, 1987), an educational simulation of clinical interviewing with the student as interviewer and the computer as client that allowed the student to question the computer client. Research on the SuperShrink program found support for the position that students prefer educational simulations that require more active involvement of the kind required by real settings even though they may also require more effort and be more frustrating. Research also found that students enjoyed the problem solving or investigatory nature of working with simulations that allowed them to question the computer (Lowman & Norkus, 1987).

The types of computer-simulation training programs that moved the computer-counselor relationship beyond simulation to consultation (and may be the shape of things to come) were Expert Systems, artificial intelligence computer programs that represented the decision-making processes of an expert, such as a master counselor. The U.S. Navy, for example, developed CATCEC (Computer Supported Assessment and Treatment Consultation for Emotional Crises) in the 1980s for use on nuclear submarines (Lichtenberg, Hummel, & Shaffer, 1984). The program was an expert consulta-

tion system for assisting a non-mental-health-expert to assess and treat emotional and behavioral emergencies in a remote area such as a submarine where a counselor is not available. The program made suggestions based on information provided by the consultee and could adapt its line of questioning based on the information provided. The potential of such expert systems programs was immense. In such a program, students could interact with a computer client who could adapt and respond to their line of questioning, similar to how a real client is affected by a counselor.

In addition to application development, during the 1980s counselor educators also began to investigate the pedagogy of teaching with computers. Several important questions had to be answered concerning the application of computer technology to training counselors. Was there any advantage of using computers, other than the novelty of the technology, over traditional methods of teaching? If computer-assisted instruction had some benefits over traditional methods, Which students benefited the most? and When and for what courses should the technology be implemented during counselor training programs? Several studies found that computer-assisted instruction did have positive impacts on students in relation to learning basic reflective skills (Alpert et al., 1984), retaining career information (Cairo & Kanner, 1984), and improving self-awareness (Matheson & Zanna, 1988). Further, the effects of computer-based instruction were found to be significantly better for low achievers, possibly due to the individualized pace that computer-assisted instruction provides the student (Skinner, 1990). In addition, a literature review on the effects of personality factors in human and computer interaction found that introverts perform better on computer-aided instruction tasks (Pocius, 1991). Counselor educators were beginning to examine the most effective methods for implementing computer-assisted instruction in their programs.

In 1988, Lambert wrote an article entitled "Computers in Counselor Education: Four Years After a Special Issue" as a follow-up to the 1984 special issue of *Counselor Education and Supervision*. He realistically identified many obstacles that impeded the further development of computer technology within the counseling field. For example, many faculty remained untrained and inexperienced in computer use and were unaware of potential benefits derived from

computer use in training. In addition, the uniqueness of some counseling courses prevented use of off-the-shelf software, and customized applications were expensive or time consuming to manufacture. For these reasons, Lambert concluded that the widespread use of computer applications for counselor training had yet to occur. Many of the problems identified by Lambert have persisted into the 1990s.

THE 1990s AND BEYOND (HEY, THIS INTERNET THING IS IMPRESSIVE!)

Interest seemed to wane in computers during the early 1990s, as indicated by a drop in computer-related articles in scholarly journals. As the 1990s have progressed, however, technological changes have occurred again and breathed new excitement into the computer–counseling relationship. The boom in Internet access and use, first in academic circles and then with the general public, has created an entire new chapter in the computer–counseling relationship. For the first time in the history of the computer–counseling relationship, the number of individuals involved with computers has grown from a small elite to a large cohort. Although beyond the scope of this chapter, the potential impact of the Internet and the World Wide Web on counseling is enormous and warrants brief illustration. Virtually all of the major counseling professional organizations have established web pages for their memberships. ERIC/CASS has established a virtual library from which the full text of articles can be downloaded to a counselor's personal computer, making access to vast amounts of information easier than ever. Counseling therapies are already being delivered on-line, and yet more information on psychological topics is available to any consumer who has a web browser. Many new ethical and professional regulation questions have sprung up since the development of web counseling.

Counselor educators have also discovered the Internet. Listservs, such as ICN (International Counseling Network) for practicing counselors, CESNET (Counselor Educators and Supervisors Network) for counselor educators and supervisors, and COUNSGRADs (Counseling Graduates) for counselor education graduate students, have become popular means of professional communication. The

advent of the World Wide Web has opened up the field of CAI and made the computerization of course content (web-authoring) easier and easier for the layperson. As a result, more and more counseling courses are being developed as computer mediated or as part of distance education projects. It is now possible to do live streaming video on the web, thus enabling a counselor educator to model techniques to students around the world.

Many limitations face the computer–counseling relationship today, however. These include the ability of counselors and faculty to be trained in web page development, the ability to find funds to research the best methods of providing instruction via the Internet, and the ability of students to access the information. Many students are limited by the bandwidth (the amount of information) they can download or process though a phone cable. Ethical considerations about use of student or client information stored in computers or about providing counseling across governmental jurisdictions are also caveats.

The past has taught us that technological limitations are usually not long lasting in the field of computers. In fact, it is usually difficult to keep up with the pace of change. The future holds many possibilities. For example, super simulations could immerse clients or students in virtual reality worlds for treatment or instruction (Rothbaum et al., 1995), or artificially intelligent consultation systems could work as assistant therapists in suggesting treatment techniques and tracking client progress. Whatever the future may hold, we can expect that the interface between the counseling profession and computer technologies will continue to expand and develop—as it has since computers were first invented.

CONCLUSION

There has been a growing relationship between the profession of counseling and computers over the last four decades (Mruk, 1989). However, not until the 1990s has the number of counselors and counselor educators involved with using computers grown to represent the actual adoption of the technology by the profession. Computers have been used in creative ways both to assist in treating clients and to help educate new counseling professionals. In look-

ing to the future, computers will, in all likelihood, continue to have an impact not only on our profession but also in a wider sense on our culture and human identity itself. To date, the pace of development of computer technologies has seemingly outpaced our profession's ability to research its application adequately and answer important ethical questions concerning its use. Dehumanizing or humanizing the computer forces us to take a new look at what it means to be human, and at the possibility that thinking machines may lead us to new insights into what it is to think and feel as a human being. Counselors are socially sanctioned healers and as such may have a role that goes beyond simple use of a technology; thus they may have a role in understanding the impact of that technology on society. Because humans like to apply anthropomorphism to machines, we must be careful in the future not do the reverse and apply mechanomorphism to our clients and students (Caporael, 1986). Perhaps the greatest challenge to our profession in the future is not only to exploit the benefits of the computer–counseling relationship but also to advocate for the use of computer technology by the society as a whole in ways that protect—rather than diminish—human freedom and dignity.

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